

REScheck™ Basics

March 2016 State Building Codes Conference

DALE HORTON, NCAT

2016 Department of Energy National Energy Codes Conference
Building Energy Codes Program



Energy Code Compliance Tools

Software

Prescriptive

UA Tradeoff

Simulated
Performance

None

REScheck

REM/Rate
REM/Design
Energy Gauge
REScheck?

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

EERE Home | Programs & Offices | Consumer Information

Building Energy Codes Program

Building Energy Codes

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Site Map

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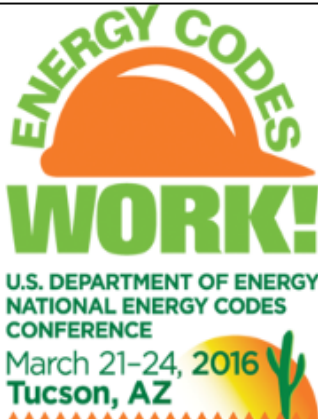
DEVELOPMENT

ADOPTION

COMPLIANCE

REGULATIONS

RESOURCE CENTER



REGISTER NOW!

March 21-24, 2016
Tucson, Arizona.



>> LEARN MORE

HIGHLIGHTS


- 2016 National Energy Codes Conference
- DOE Proposals for the 2018 IECC
- Upcoming Training Events & Available Resources
- Residential Energy Code Field Study
- Training Materials for the 2015 IECC and Standard 90.1-2013

Popular Links


Tools

 [COMcheck](#)  [REScheck](#)







Technical Assistance

 [Help Desk](#)

Status of State Energy Codes



News

- [Yes, saving energy is cheaper than making energy](#) 
Source: ACEEE, posted: 01.27.2016
- [2015 was a good year for energy efficiency, 2016 could be even better](#) 
Source: ACEEE, posted: 01.01.2016
- [Sacramento Has the Most Net-Zero Buildings of Any City in America](#) 
Source: Greentech Media, posted: 01.13.2016
- [Do Energy Codes Work?](#) 
Source: Energy Manager Today, posted: 01.04.2016
- [EERE News and Blog](#) 
Source: Energy.gov
- [DoE: Building Energy Codes are Working](#) 
Source: Energy Manager Today, posted: 01.05.2016

<https://www.energycodes.gov/rescheck>

[See if your state or county can use REScheck to show compliance.](#)

REScheck™ Software

Windows

Mac

REScheck-Web

Technical Support

REScheck™ for Windows®

Version 4.6.2 (Build Version: 4.6.2.1)

Runs on Vista or Windows 7 in either single, multi-user, or network environments

Supported Codes:

2009, 2012 and 2015 IECC; and various state and county energy codes.

What's New:


REScheck version 4.6.2 includes support for 2014 Florida. Build version 4.6.2.1 fixes an issue with compliance index when project is "Additions" and discontinues support for Wisconsin Uniform Dwelling Code.



[Download REScheck Now!](#)



UPDATES TO RESCHECK AND COMCHECK BUILDING ENERGY CODE COMPLIANCE SOFTWARE

The U.S. Department of Energy (DOE) is directed to provide technical assistance to states to support the implementation of model residential and commercial building energy codes (42 USC 6833). As part of this assistance, the DOE Building Energy Codes Program provides ongoing support for REScheck and COMcheck compliance software, which are updated based on new editions of the model codes. DOE has published [guidance](#)  surrounding its support for the software, including technical assistance requests for modified versions.

"DESKTOP"

Jones Residence.Boulder.Co.rck - REScheck 4.6.2 Code: 2015 IECC

File Edit View Options Code Tools Help

Project Envelope Mechanical Requirements

Location

State:

City:

Project Type

☒ New Construction ☐ Addition ☐ Alteration

Building Characteristics

☒ 1- and 2-Family, Detached ☐ Multifamily

Conditioned Floor Area: ft²

☐ All ducts and air handlers located within conditioned spaces
[Explanation of duct testing requirements...](#)

☐ Project includes a thermally isolated sunroom

☒ Passes

Compliance Method: UA Trade-Off Max. UA: Your UA:

Choose the state in which the building will be located.


Project Details (optional)

This information will appear on the compliance certificate.

Title/Site/Permit

WEB

REScheck-Web - 2015 IECC - Internet Explorer

 Project title:

2015 IECC

PROJECT ENVELOPE MECHANICAL REQUIREMENTS Reports

Code/Location

Code: [What's my code?](#)

State:

☒ City:

☐ County:

If your location is not included here, choose a nearby location with similar weather conditions.

Project Type

☒ New Construction ☐ Addition ☐ Alteration

Building Characteristics

☒ 1- and 2-Family, Detached ☐ Multifamily

Conditioned Floor Area: ft²

☐ All ducts and air handlers are located within conditioned spaces
[Explanation of duct testing requirements](#)

☐ Project includes a thermally isolated sunroom

☐ Project includes a pool or inground spa

☐ Project includes an interior wood-burning fireplace

Project Details (optional)

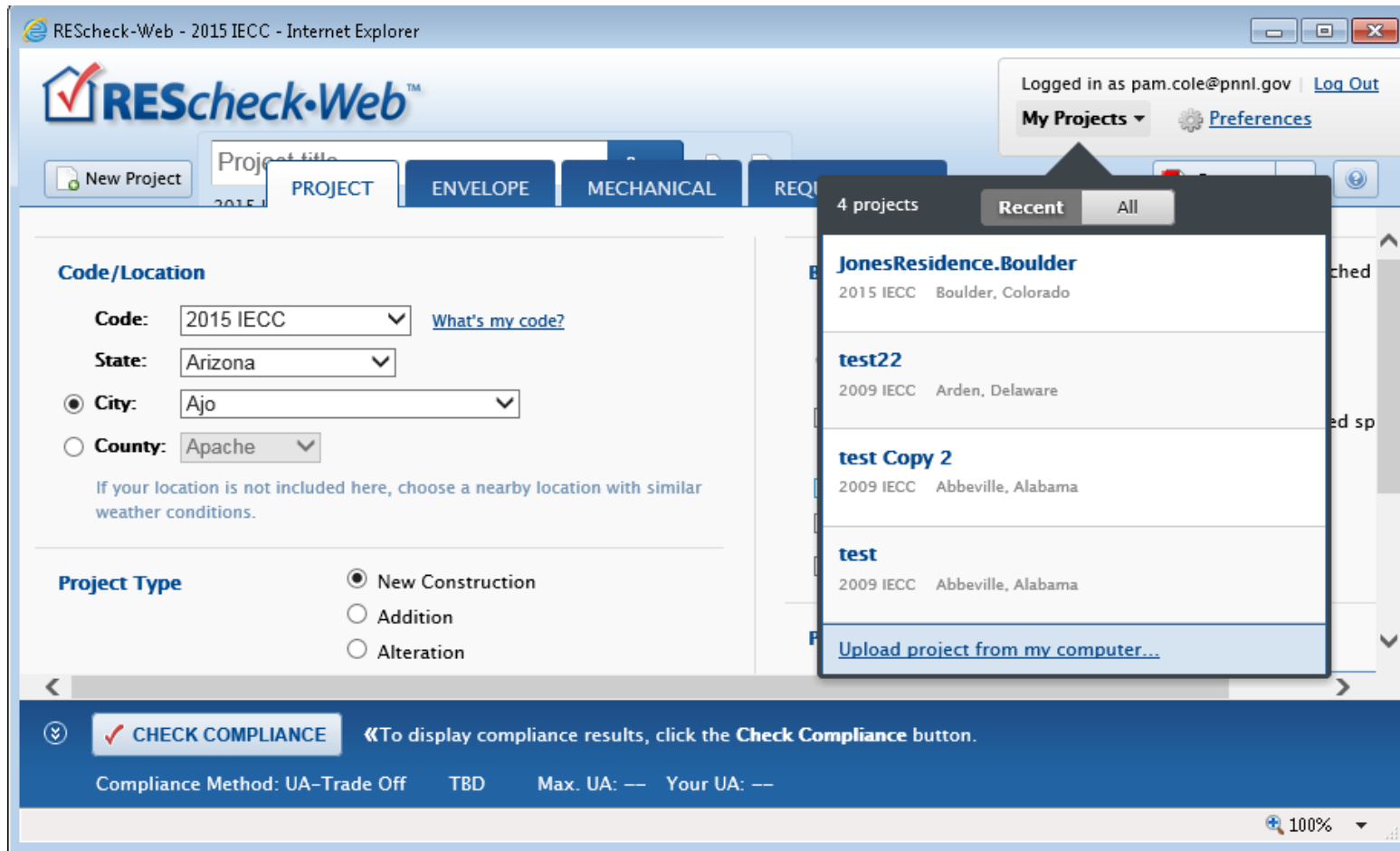
To display compliance results, click the Check Compliance button.

Compliance Method: UA-Trade Off TBD Max. UA: — Your UA: —

100%

Data Exchange

- ▶ Can exchange files between desktop and web
 - Log in to web
 - My Projects



REScheck-Web - 2015 IECC - Internet Explorer

REScheck-Web™

New Project

Project title

PROJECT ENVELOPE MECHANICAL REQUIREMENTS

Logged in as pam.cole@pnnl.gov | [Log Out](#)

My Projects [Preferences](#)

4 projects **Recent** All

JonesResidence.Boulder
2015 IECC Boulder, Colorado

test22
2009 IECC Arden, Delaware

test Copy 2
2009 IECC Abbeville, Alabama

test
2009 IECC Abbeville, Alabama

[Upload project from my computer...](#)

Code/Location

Code: 2015 IECC [What's my code?](#)

State: Arizona

City: Ajo

County: Apache

If your location is not included here, choose a nearby location with similar weather conditions.

Project Type

☒ New Construction
☐ Addition
☐ Alteration

CHECK COMPLIANCE «To display compliance results, click the **Check Compliance** button.

Compliance Method: UA-Trade Off TBD Max. UA: — Your UA: —

100%

Walkthrough REScheck Steps

**1. Select
Preferences**

**2. Select
Code**

**3. Select
Compliance
Path**

**4. Enter
Project Info**

**5. Enter Building
Components**

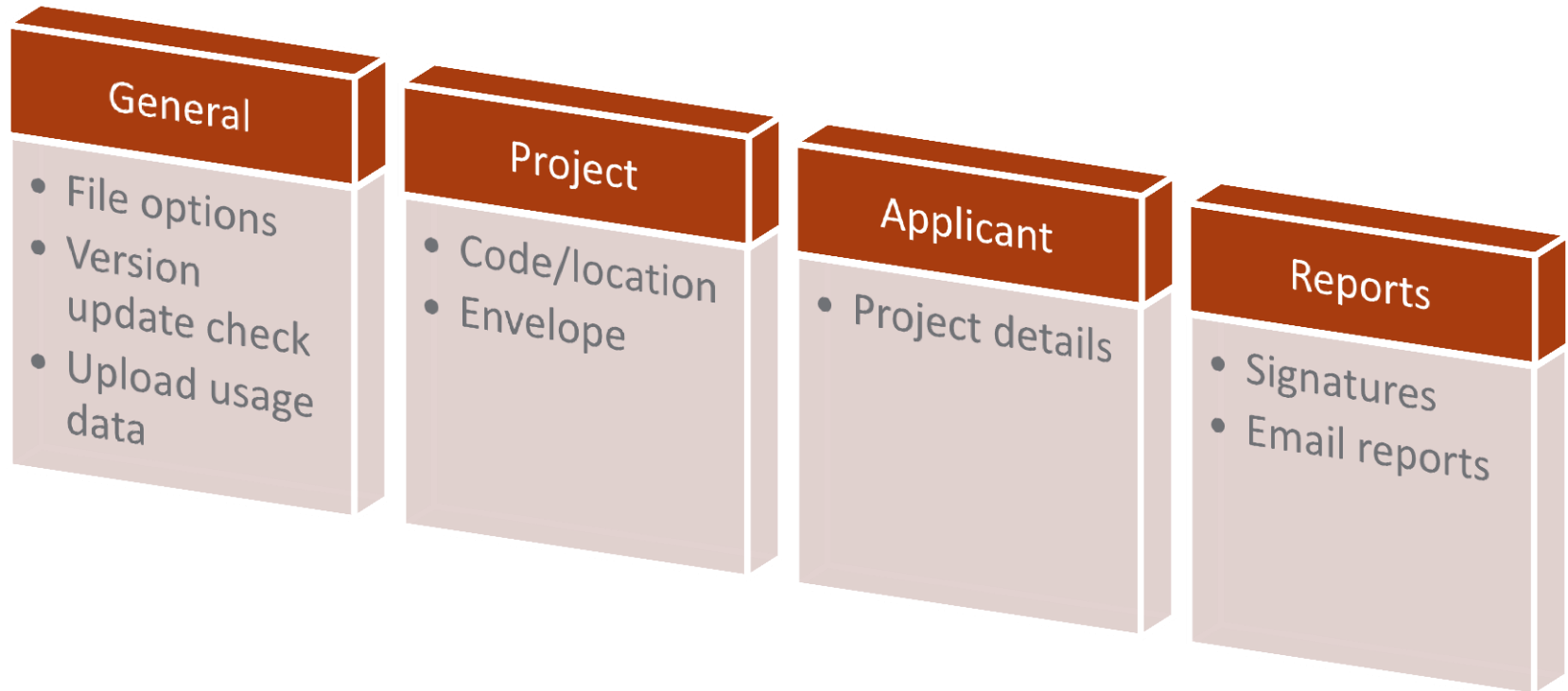
Optional

**6. Enter
Mechanical
Equipment**

**7. Complete
Requirements
Tab**

Save and Print Report

Preferences



Select the Appropriate Code

► Applicable to your state/ jurisdiction (Code menu)

ADOPTION PROCESS

STATE TECHNICAL ASSISTANCE

STATUS OF STATE ENERGY CODE ADOPTION

COMPLIANCE

REGULATIONS

RESOURCE CENTER

Model building energy codes and standards have the potential to save U.S. consumers an estimated \$330 billion by 2040. This equates to nearly 80 quads of cumulative full-fuel-cycle energy savings and over 6.2 billion metric tons of avoided carbon dioxide emissions. View the BECP's [national benefits assessment](#) for more information on the benefits of building energy codes

National Status At-A-Glance

The current status of energy codes and standards adoption is shown in the maps below. Status is displayed for both residential and commercial buildings for U.S. States and territories. Choose from the drop-down list to view the details for a particular state.

Select a state ▼

Commercial: Current

Residential: Current

Current Residential Building Energy Code Adoption Status

Legend:

- 3 IECC 2015, equivalent, or more energy efficient
- 28 IECC 2009, equivalent, or more energy efficient
- 10 IECC 2012, equivalent, or more energy efficient
- 15 Older or less energy efficient than IECC 2009, or no statewide code

* Adopted new Code to be effective at a later date

As of March 2016

Project Information

- ▶ Project Location
 - City/County
- ▶ Project Type
 - Single Family/Duplex
 - Multi Family
- ▶ Building Characteristics
 - New Construction
 - Addition
 - Alteration
- ▶ Project Details
 - Optional
 - Get printed on reports



► Multifamily if

- All multifamily buildings three stories or less in height above grade and
- Contain three or more attached dwelling units

■ Examples

- Apartments
- Condominiums
- Townhouses
- Dormitories
- Rowhouses



- ▶ Select New Construction, Addition or Alteration
- ▶ Additions
 - Addition only
 - Addition plus existing home
- ▶ Alterations
 - Exemptions may apply

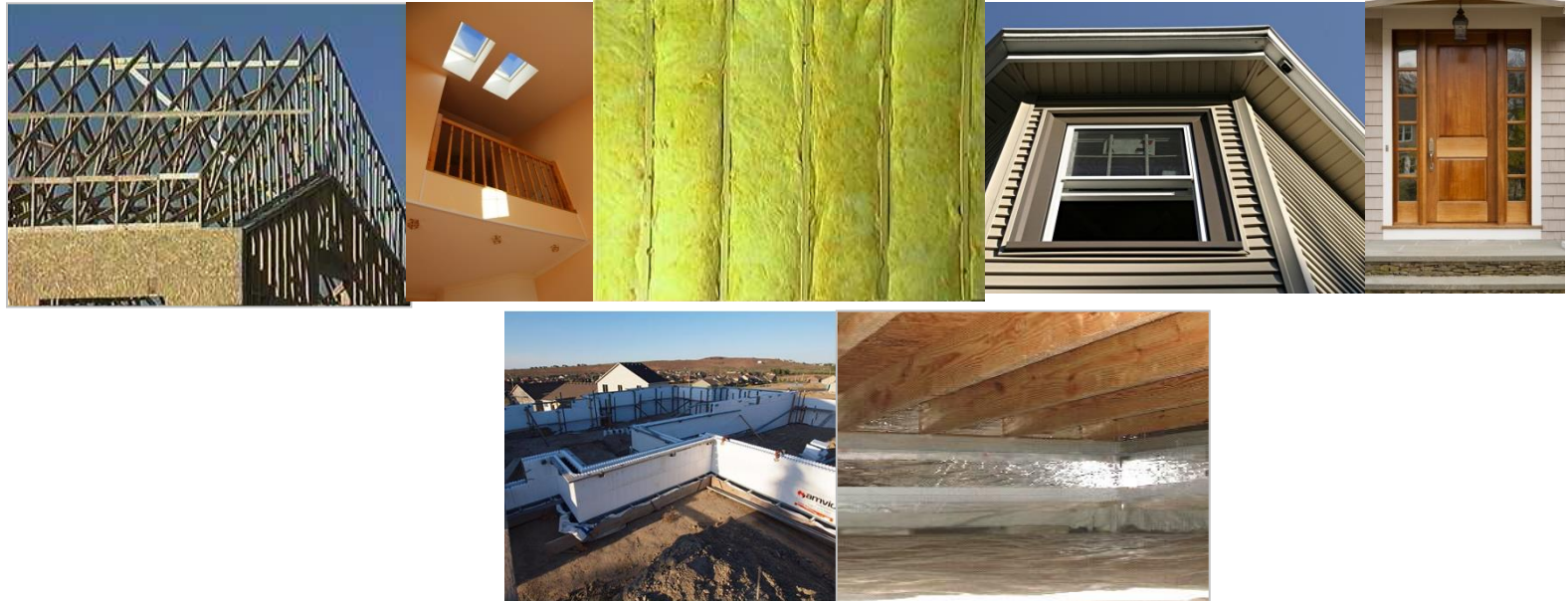
Alteration - would enter only portions of thermal envelop that you are touching

For example – only enter windows that you are changing, not other existing windows.

What is the Building Thermal Envelope?



Enter only applicable building components



Envelope Helpful Hints

- ▶ Don't have to use every button
- ▶ Can group “like” components
- ▶ Gross area (except slab-on-grade)
 - Gross *wall* area to include peripheral edges of floors (area of band joist and subfloor between floors)
- ▶ Use “Other” assembly as needed



File Edit View Options Code Tools Help								
Project Envelope Mechanical Requirements								
Ceiling Skylight Wall Window Door Basement Floor Crawl Wall								
	Component	Assembly	Gross Area		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA
	Building							
1	Skylight 1	Click here to select Asse...	0	ft2			0.0	0

Envelope Helpful Hints, con't

- ▶ **Fenestration ratings** – U-factor and SHGC
- ▶ **Cavity R-value** – used for insulation placed between structural members
- ▶ **Continuous R-value** – used for insulation that is continuous across the structure (e.g., rigid insulation)
- ▶ After you've entered all building thermal envelope components, **hit Check Compliance**
 - Look for fields with red text
 - If no compliance results, look for missing data and make sure you've made an entry for Building Use type



SHGCs and U-Factors

	World's Best Window Co. Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider	
ENERGY PERFORMANCE RATINGS		
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient	
0.35	0.32	
ADDITIONAL PERFORMANCE RATINGS		
Visible Transmittance	Air Leakage (U.S./I-P)	
0.51	0.2	
Condensation Resistance	—	
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole-product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>		

Cavity vs. Continuous



Foundations – what button to use

Basement

- Basement is conditioned

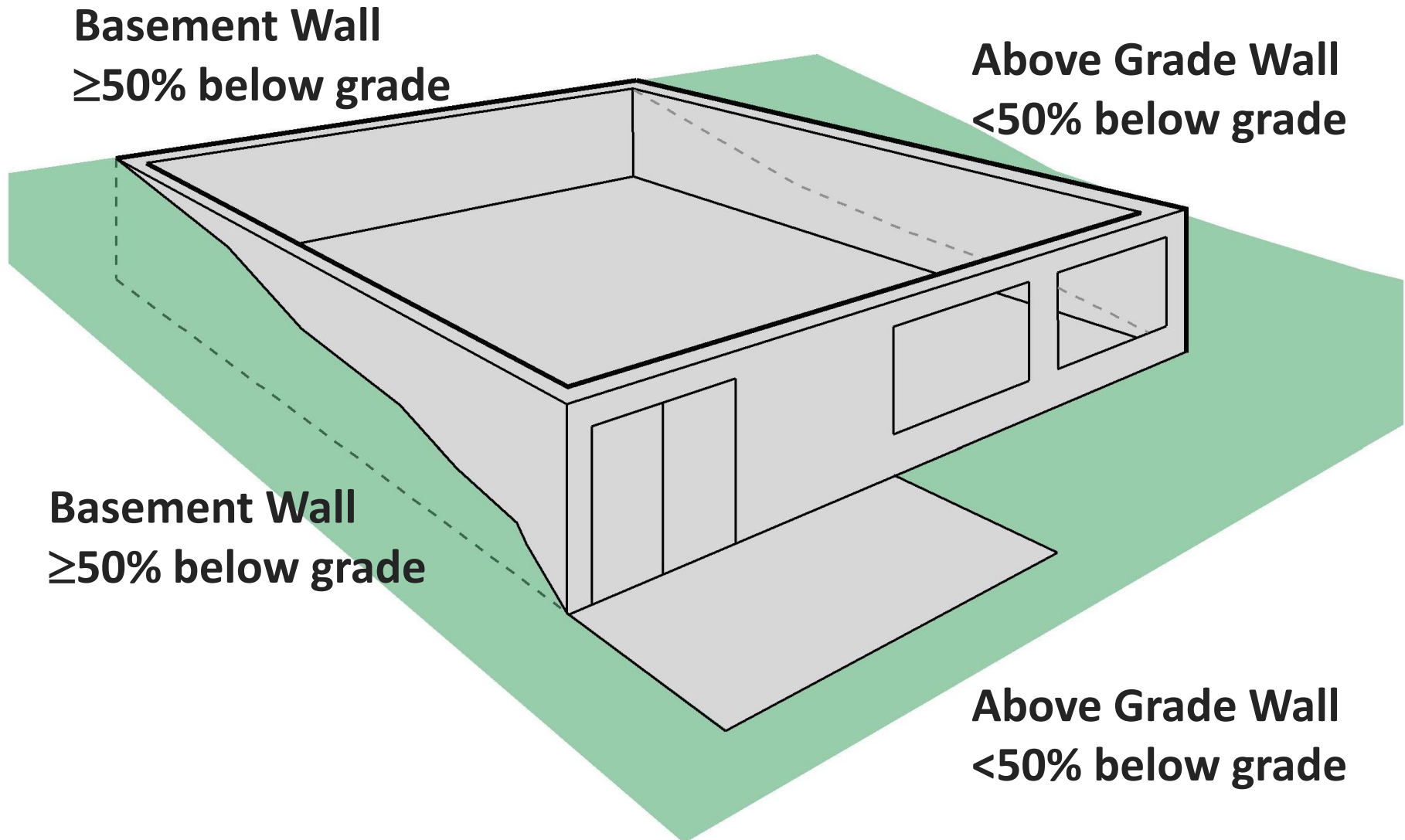
Floor

- Separates conditioned from unconditioned space

Crawl Wall

- Crawl space is not vented to the outside and floor above is NOT insulated

What's a Basement Wall?



Basements Helpful Hints

▶ Wall Height

- from top of wall to basement floor
- If not uniform, provide an average height

▶ Depth Below Grade

- Depth that the wall extends from finished, outside grade surface to basement floor
- If sloped or uneven, provide an average depth below grade



▶ Depth of Insulation

- Measure from top of wall to where insulation stops
 - For a fully insulated wall, depth of insulation would be equal to height of the wall
- If you enter insulation depth of 0, program assumes no insulation, regardless of values in the insulation fields

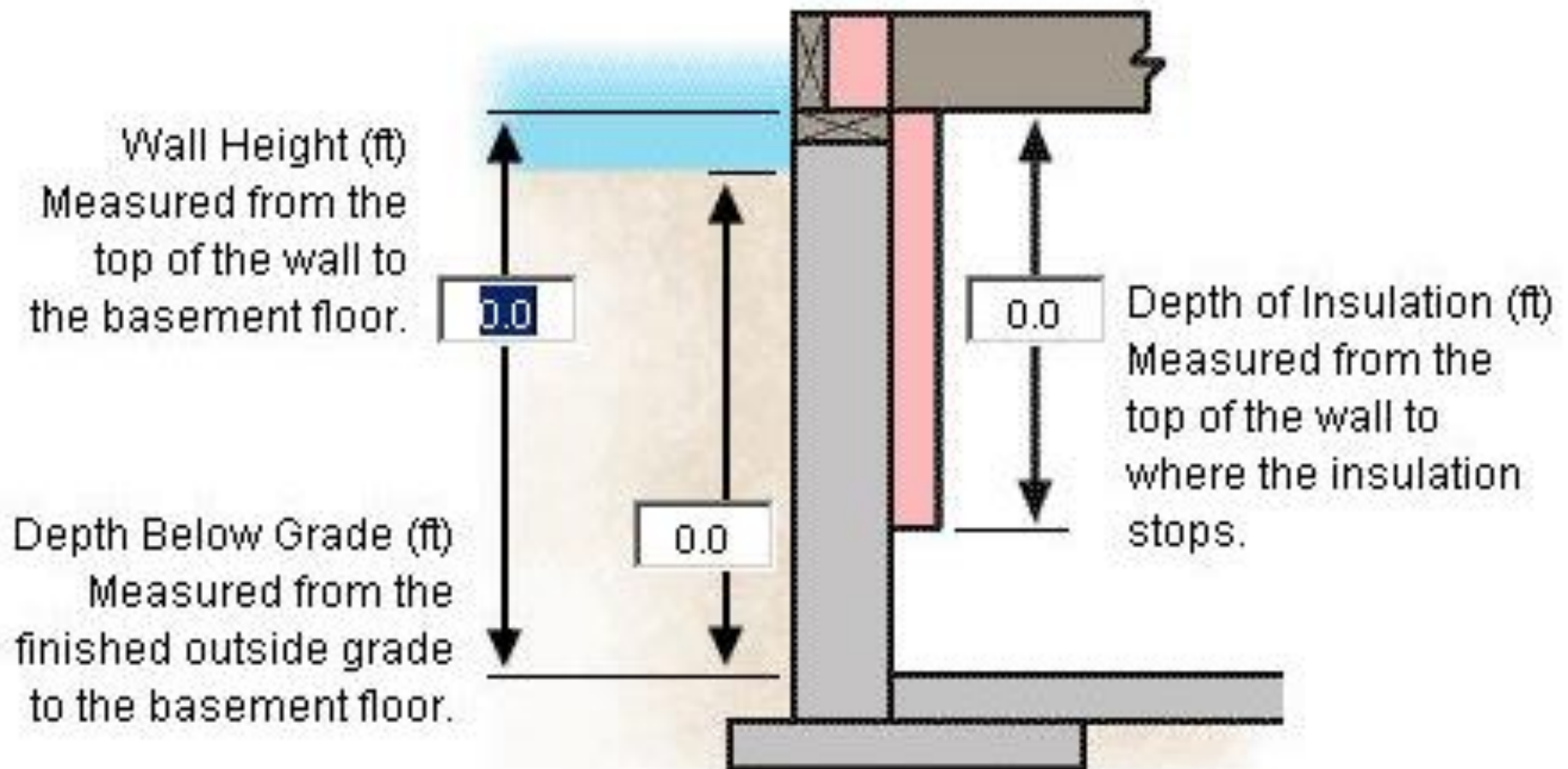
▶ Continuous Insulation

- Software assumes it's exterior rigid

▶ Cavity Insulation

- Software assumes you're furring out on the interior

Basement Walls



Red

Project		Envelope		Mechanical		Requirements													
Ceiling		Skylight		Wall		Window		Door		Basement		Floor		Crawl Wall					
	Component		Assembly				Orientation		Gross Area			Cavity Insulation R-Value		Continuous Insulation R-Value		U-Factor		UA	
	Building																		
1	Ceiling 1		Flat Ceiling or Scissor Truss						0	ft2		0.0		0.0		0.568		0	

Green

✓	Passes	1.0	% Better Than Code
---	--------	-----	--------------------

Blue

⚠	No envelope assemblies specified	TBD	%
---	----------------------------------	-----	---

Screen Operations

MDB.Residence.rck - REScheck Code: 2009 IECC


File Edit View Options Code Tools Help

Front Faces: North

Project **Envelope** **Mechanical** **Requirements**

Ceiling Skylight Wall Window Door Basement Floor Crawl Wall

	Component	Assembly	Orientation	Gross Area or Slab Perimeter	Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA	Wall Height (ft)	Depth Below Grade (ft)	Depth of Insulation (ft)
Building											
1	Ceiling 1	All-Wood Joist/Rafter/Truss		2415	ft2	30.0	0.0	0.035	85		
2	Exterior Wall 1	Wood Frame, 16" o.c.	Front	911	ft2	20.0	0.0	0.059	30		
3	Door 1	Opaque	Front	40	ft2			0.5	20		
4	Window main	Vinyl Frame, Double Pane	Front	369	ft2			0.35	129		
5	Exterior Wall 2	Wood Frame, 16" o.c.	Back	834	ft2	20.0	0.0	0.059	38		
6	Window 2	Vinyl Frame:Double Pane ...	Back	149	ft2			0.35	52		
7	Door 2	Solid	Back	40	ft2			0.5	20		
8	Exterior Wall 3	Wood Frame, 16" o.c.	Left Side	492	ft2	20.0	0.0	0.059	29		
9	Exterior Wall 4	Wood Frame, 16" o.c.	Right Side	632	ft2	20.0	0.0	0.059	36		
10	Window 3	Vinyl Frame:Double Pane ...	Right Side	15	ft2			0.35	5		
11	Knee Wall West	Wood Frame, 16" o.c.	Left Side	69	ft2	20.0	0.0	0.059	4		
12	Knee Wall East	Wood Frame, 16" o.c.	Right Side	84	ft2	20.0	0.0	0.059	5		
13	Basement Wall 2	Solid Concrete or Masonry	Left Side	144	ft2	19.0	0.0	0.061	9	9.0	4.5
14	Basement Wall 1	Solid Concrete or Masonry	Right Side	216	ft2	19.0	0.0	0.061	13	9.0	4.5
15	Basement Wall 3	Solid Concrete or Masonry	Front	684	ft2	19.0	0.0	0.051	35	9.0	7.0
16	Floor 1	All-Wood Joist/Truss, Ov...		783	ft2	30.0	0.0	0.033	26		
17	Floor 2	Slab-On-Grade:Unheated		93	ft		10.0	0.767	71		2.0

 **Fails** 4.3 % Worse Than Code

Compliance Method: UA Trade-Off Max. UA 582 Your UA 607

Select the building assembly buttons above the column headers to create a list of envelope components for the building.

Compliance Bar →

Status Bar →

▶ UA

- U-factor x Area for each building assembly
- UA from building conforming to code compared against your building UA

▶ Simulated Performance alternative

- Based on simulated performance of your building compared to an equivalent code building
- Requires additional inputs (over UA approach): building orientation, minimum of four walls having unique orientations, and a minimum of one roof and floor
- Check Compliance button

▶ Performance alternative considers the whole building energy performance, whereas UA trade-off method considers only the thermal conductance of envelope components

- Limited performance approach
- Does not represent the true above code performance
- Not to be used for home energy ratings, energy efficiency tax credit calculations or other incentive programs

- Limited to building envelope
- No credit is provided for:
 - Overhang projection factor
 - Air tightness of the building envelope
 - Sun rooms/passive solar characteristics
 - Mechanical ventilation effectiveness
 - Duct leakage
 - Detailed equipment performance characteristics

REM/Rate Simulated Performance Report

2012 IECC Energy Cost Compliance

REM/RateTM



REM/RateTM IS
THE MOST WIDELY
USED RATING SOFTWARE
IN THE U.S.

Property
Dale Horton and Jody Miller
3713 Creekwood Road
Missoula, MT 59802

Weather: Missoula, MT
HortonMiller House
HortonMiller House Mar 2016.blg

Organization
NCAT
406/721-9908
Dale Horton

Builder
Southwall Builders

HERS
Site Visit
2/1/16
Rating No: NA
Rater ID: Pending

Annual Energy Cost

	2012 IECC	\$/yr As Designed
Heating	502	461
Cooling	145	175
Water Heating	430	430
SubTotal - Used to Determine Compliance	1078	1066
Lights & Appliances	768	748
Photovoltaics	-0	-0
Service Charge	142	142
Total	1988	1956

Mandatory Requirements

Annual Energy Cost Check	PASSES
Duct Insulation R-Value Check (per Section 405.2)	PASSES
Window U-Value and SHGC Check (per Section 402.5)	PASSES
Home Infiltration (Section 402.4.1.2)	PASSES
Duct Leakage (Section 403.2.2)	PASSES
Mechanical Ventilation (Section 403.6)	PASSES
Mechanical Ventilation Fan Efficacy (Section 403.5.1)	PASSES
Mandatory Requirements Check Box (2012 IECC)	PASSES

This home **MEETS** the annual energy cost requirements of Section 405 of the 2012 International Energy Conservation Code based on a climate zone of 6B. In fact, this home surpasses the requirements by 1.1%.

Name | Dale Horton
Organization | NCAT

Signature |
Date | 25 March 2016

REM/Rate Simulated Performance Report

2012 IECC Energy Cost Compliance

Annual Energy Cost

\$/yr

	2012 IECC	As Designed
Heating	502	461
Cooling	145	175
Water Heating	430	430
SubTotal - Used to Determine Compliance	1078	1066
Lights & Appliances	768	748
Photovoltaics	-0	-0
Service Charge	142	142
Total	1988	1956

Mandatory Requirements

Annual Energy Cost Check	PASSES
Duct Insulation R-Value Check (per Section 405.2)	PASSES
Window U-Value and SHGC Check (per Section 402.5)	PASSES
Home Infiltration (Section 402.4.1.2)	PASSES
Duct Leakage (Section 403.2.2)	PASSES
Mechanical Ventilation (Section 403.6)	PASSES
Mechanical Ventilation Fan Efficacy (Section 403.5.1)	PASSES
Mandatory Requirements Check Box (2012 IECC)	PASSES

Compliance Failing – Helpful Hints

- ▶ Review building plans to ensure all components are entered correctly
- ▶ Confirm takeoffs (areas) are correct
- ▶ Confirm insulation values
 - Double check cavity vs. continuous entries
- ▶ Look at UA column (*next slide*)





Compliance Failing – Helpful Hints, con't

Jones Residence.rck - REScheck 4.6.2 Code: 2015 IECC

File Edit View Options Code Tools Help

Project Envelope Mechanical Requirements

Ceiling Skylight Wall Window Door Basement Floor Crawl Wall

	Component	Assembly	Gross Area or Slab Perimeter		Cavity Insulation R-Value	Continuous Insulation R-Value	U-Factor	UA	SHGC	Wall Height (ft)	Depth Below Grade (ft)	Depth of Insulation (ft)
7	Door 2	Solid	40	ft2			0.5	20				
8	Wall 3	Wood Frame, 16" o.c.	492	ft2	20.0	0.0	0.059	29				
9	Wall 4	Wood Frame, 16" o.c.	632	ft2	20.0	0.0	0.059	36				
10	Window 3	Vinyl Frame:Double Pa...	15	ft2			0.35	5	0.25			
11	Knee Wall We	Wood Frame, 16" o.c.	69	ft2	20.0	0.0	0.059	4				
12	Knee Wall Ea	Wood Frame, 16" o.c.	84	ft2	20.0	0.0	0.059	5				
13	Basement Wa	Solid Concrete or Mas...	144	ft2	0.0	0.0	0.418	60		9.0	4.5	0.0
14	Basement Wa	Solid Concrete or Mas...	216	ft2	0.0	0.0	0.418	90		9.0	4.5	0.0
15	Basement Wa	Solid Concrete or Mas...	684	ft2	0.0	0.0	0.267	183		9.0	7.0	0.0
16	Floor 1	All-Wood Joist/Truss:O...	783	ft2	19.0	0.0	0.047	37				
17	Floor 2	Slab-On-Grade:Unhea...	93	ft		0.0	1.042	97				0.0

☒ Fails
 50.8 % Worse Than Code

Compliance Method: UA Trade-Off
 Max. UA
 Your UA

Select the building assembly buttons above the column headers to create a list of envelope components for the building.

- ▶ Mandatory requirements
 - Air leakage
 - Building mechanical systems and equipment
 - Service water heating
 - Duct construction, insulation, testing
- ▶ For each requirement, the user
 - Notes that a code requirement is
 - Met
 - Exempt
 - Does not apply
 - Notes how compliance for applicable requirements are documented
- ▶ This information is shown on the report in the “Comments/ Assumptions” column of the Inspection Checklist

- ▶ File → View / Print Report
- ▶ Choices, choose any or all
 - Compliance Certificate
 - Inspection Checklist
 - Panel Certificate

- ▶ Implement Requirements tab
- ▶ Inspection checklists set up by phase of construction
 - Plan Review
 - Footing/Foundation
 - Rough-in
 - Final

Reports – Sample Compliance Certificate, con't



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965



REScheck Software Version 4.6.2

Compliance Certificate

Project Jones Residence - Plan 3677

Energy Code: **2015 IECC**
Location: **Tucson, Arizona**
Construction Type: **Single-family**
Project Type: **New Construction**
Conditioned Floor Area: **6,780 ft²**
Glazing Area: **18%**
Climate Zone: **2 (1447 HDD)**
Permit Date: **March 15, 2016**
Permit Number:

Construction Site: Owner/Agent:
J.J. Jones

Verify energy code,
location, construction
type, and conditioned
floor area

Compliance: Passes using UA trade-off

Compliance: **14.6% Better Than Code** Maximum UA: **1043** Your UA: **891** Maximum SHGC: **0.25** Your SHGC: **0.25**

The % Better or Worse Than Code Index reflects how close to compliance the house is based on code trade-off rules.
It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	U-Factor	UA
Ceiling 1: Flat Ceiling or Scissor Truss	2,415	30.0	0.0	0.035	85
Wall 1: Wood Frame, 16" o.c.	911	20.0	0.0	0.059	30
Window 1: Vinyl Frame:Double Pane SHGC: 0.25	369			0.270	100
Door 1: Solid	40			0.500	20
Wall 2: Wood Frame, 16" o.c.	834	20.0	0.0	0.059	38

Reports – Sample Compliance Certificate, con't

SHGC: 0.25					
Door 2: Solid	40			0.500	20
Wall 3: Wood Frame, 16" o.c.	492	20.0	0.0	0.059	29
Wall 4: Wood Frame, 16" o.c.	632	20.0	0.0	0.059	36
Window 3: Vinyl Frame:Double Pane with Low-E SHGC: 0.25	15			0.350	5
Knee Wall West: Wood Frame, 16" o.c.	69	20.0	0.0	0.059	4
Knee Wall East: Wood Frame, 16" o.c.	84	20.0	0.0	0.059	5
Basement Wall 1: Solid Concrete or Masonry Wall height: 9.0' Depth below grade: 4.5' Insulation depth: 0.0'	144	0.0	0.0	0.418	60
Basement Wall 2: Solid Concrete or Masonry Wall height: 9.0' Depth below grade: 4.5' Insulation depth: 0.0'	216	0.0	0.0	0.418	

Project Title: Jones Residence - Plan 3677

Report date: 03/

Data filename: J:\NationalWorkshop\2016\Pre Conference Day\Jones Residence.rck

Page 1

Verify Values are
Consistent with
Plans

	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	U-Factor	UA
Basement Wall Wall height: 9.0' Depth below grade: 4.5' Insulation depth: 0.0'	684	0.0	0.0	0.267	183
Floor 1: All-Wood	783	19.0	0.0	0.047	37
Floor 2: Slab-On-Grade Insulation depth: 0.0'	93		0.0	1.042	97

Verify Compliance
Statement is Signed

Compliance Statement: The proposed building design described here is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the 2015 IECC requirements in REScheck Version 4.6.2 and to comply with the mandatory requirements listed in the REScheck Inspection Checklist.









Done Right Construction

Name - Title

Signature

Date

Envelope Sample Inspection Checklist

2009 IECC	Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
402.1.1 [FO1] ¹ 	Slab edge insulation R-value.	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
303.2, 402.2.8 [FO2] ¹ 	Slab edge insulation installed per manufacturer's instructions.			<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
402.1.1 [FO3] ¹ 	Slab edge insulation depth/length.	_____ ft	_____ ft	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
402.1.1 [FO4] ¹ 	Conditioned basement wall insulation R-value. Where internal insulation is used, verification may need to occur during Insulation Inspection. Not required in warm-humid locations in Climate Zone 3.	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
303.2 [FO5] ¹ 	Conditioned basement wall insulation installed per manufacturer's instructions.			<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
402.2.7 [FO6] ¹ 	Conditioned basement wall insulation depth of burial or distance from top of wall.	_____ ft	_____ ft	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
303.2.1 [FO11] ² 	A protective covering is installed to protect exposed exterior insulation and extends a minimum of 6 in. below grade.			<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
403.8 [FO12] ² 	Snow- and ice-melting system controls installed.			<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Envelope Sample Inspection Checklist, con'

Code
Section #



2009 IECC	Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	
402.1.1 [FO1] 	Slab edge insulation R-value.	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See value

Envelope Sample Inspection Checklist, con't

2009 IECC	Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
2.1.1 01]	Slab edge insulation R-value.	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.



Inspection
Type

youtube.com is now fullscreen.

Press ESC at any time to exit.

Value from
Plans



2009 IECC	Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	
402.1.1 [FO1] 	Slab edge insulation R-value.	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See value







Envelope Sample Inspection Checklist, con'

2009 IECC	Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	
402.1.1 [FO1] 	Slab edge insulation R-value.	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	R-_____ <input type="checkbox"/> Unheated <input type="checkbox"/> Heated	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not Comply <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See value

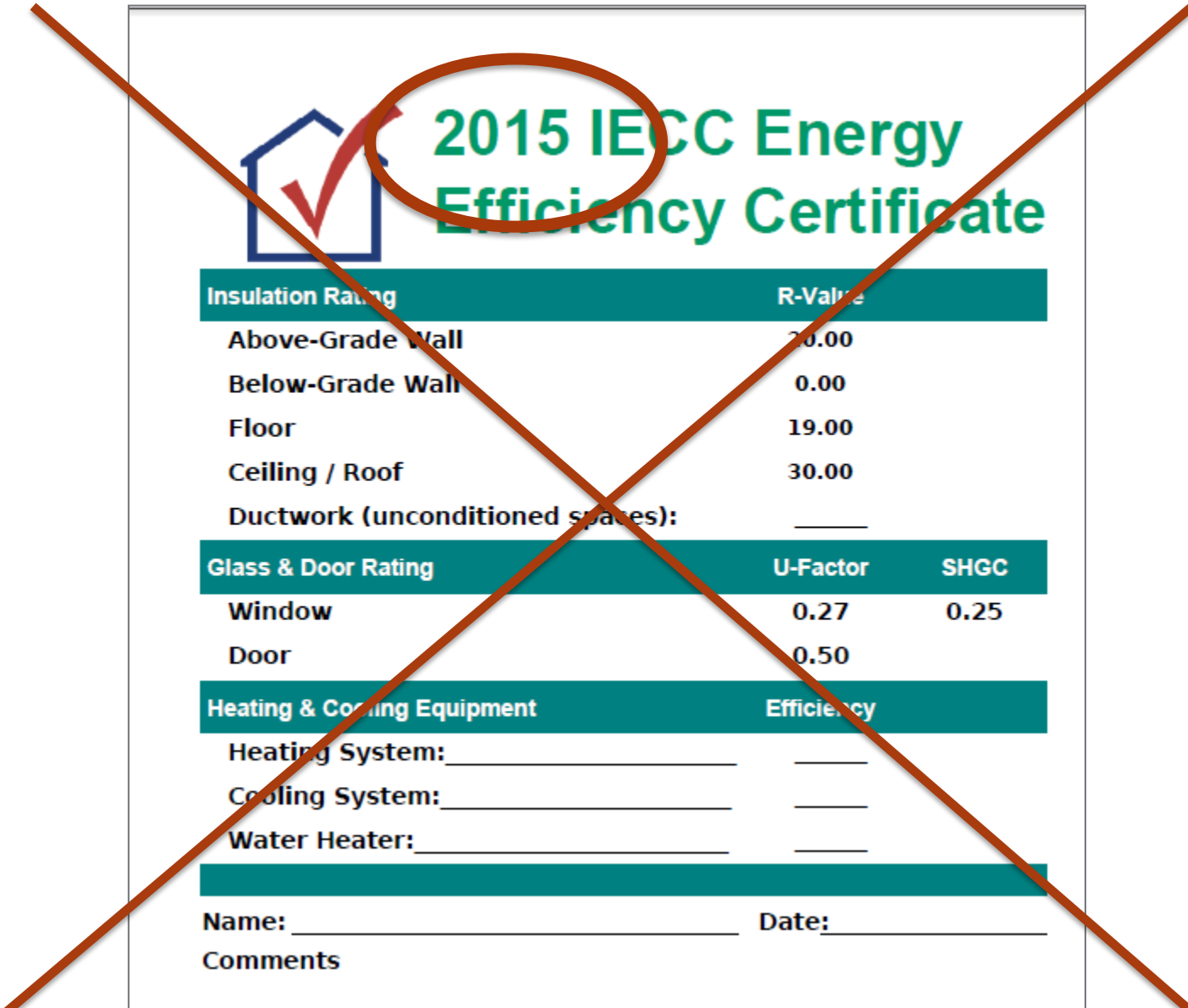



**Value from
Field**

Envelope Sample Inspection Checklist, con't

Code Section #		Value from Plans		Compliance	
					
302.1, 403.7 [PR2] ² 	Heating and cooling equipment is sized per ACCA Manual S based on loads calculated per ACCA Manual J or other methods approved by the code official.	Heating: Btu/hr ____ Cooling: Btu/hr ____	Heating: Btu/hr ____ Cooling: Btu/hr ____	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
					
	Inspection Type		Value from Field		

Panel Certificate



 **2015 IECC Energy Efficiency Certificate**

Insulation Rating	R-Value
Above-Grade Wall	20.00
Below-Grade Wall	0.00
Floor	19.00
Ceiling / Roof	30.00
Ductwork (unconditioned spaces):	_____

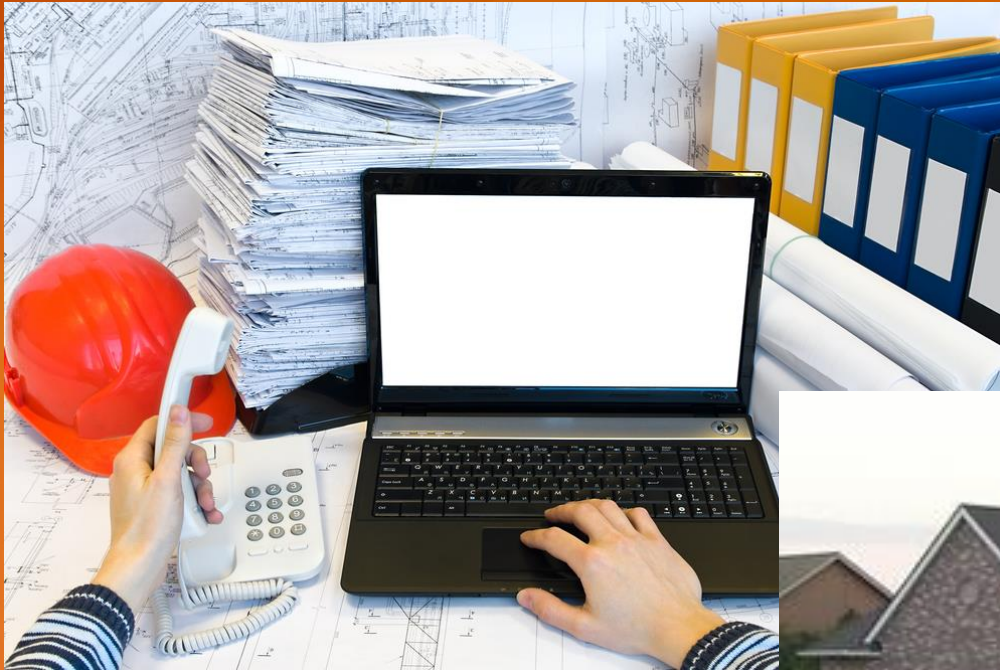
Glass & Door Rating	U-Factor	SHGC
Window	0.27	0.25
Door	0.50	

Heating & Cooling Equipment	Efficiency
Heating System: _____	_____
Cooling System: _____	_____
Water Heater: _____	_____

Name: _____ Date: _____

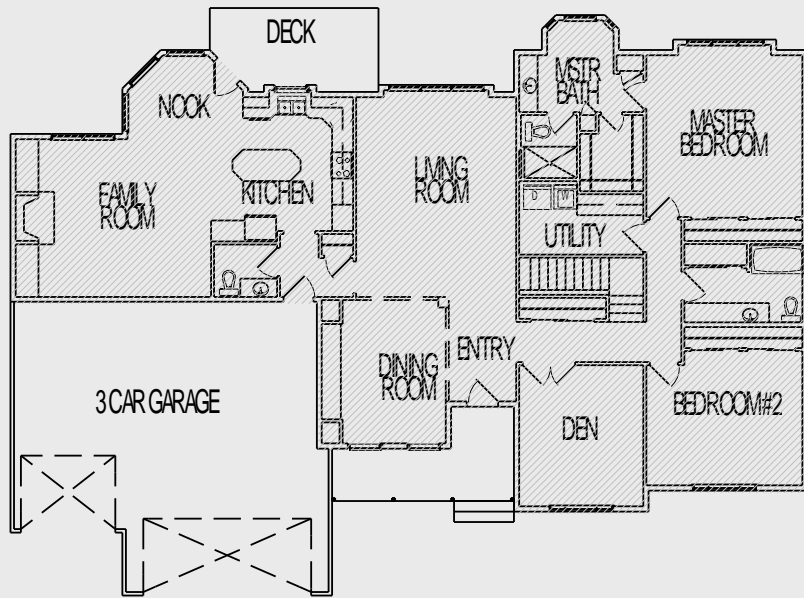
Comments _____

Applying REScheck Software

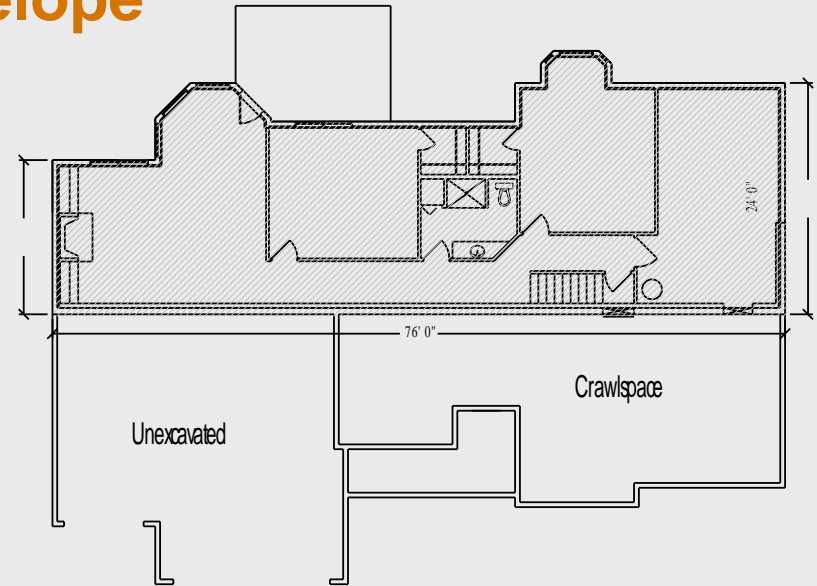


Jones Residence

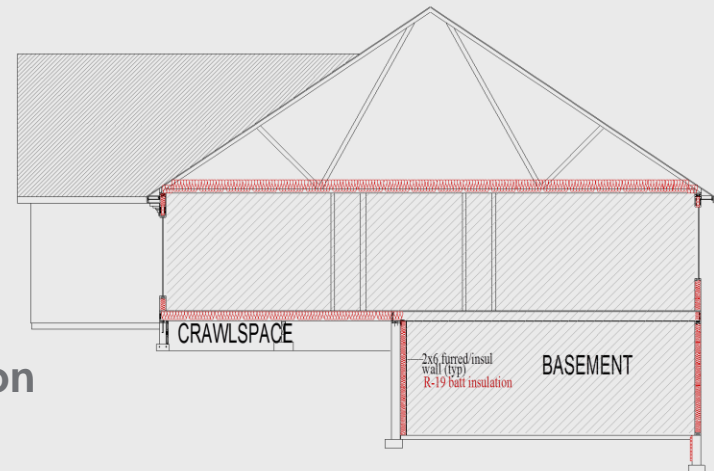
► Define Building Thermal Envelope



Conditioned Main Floor



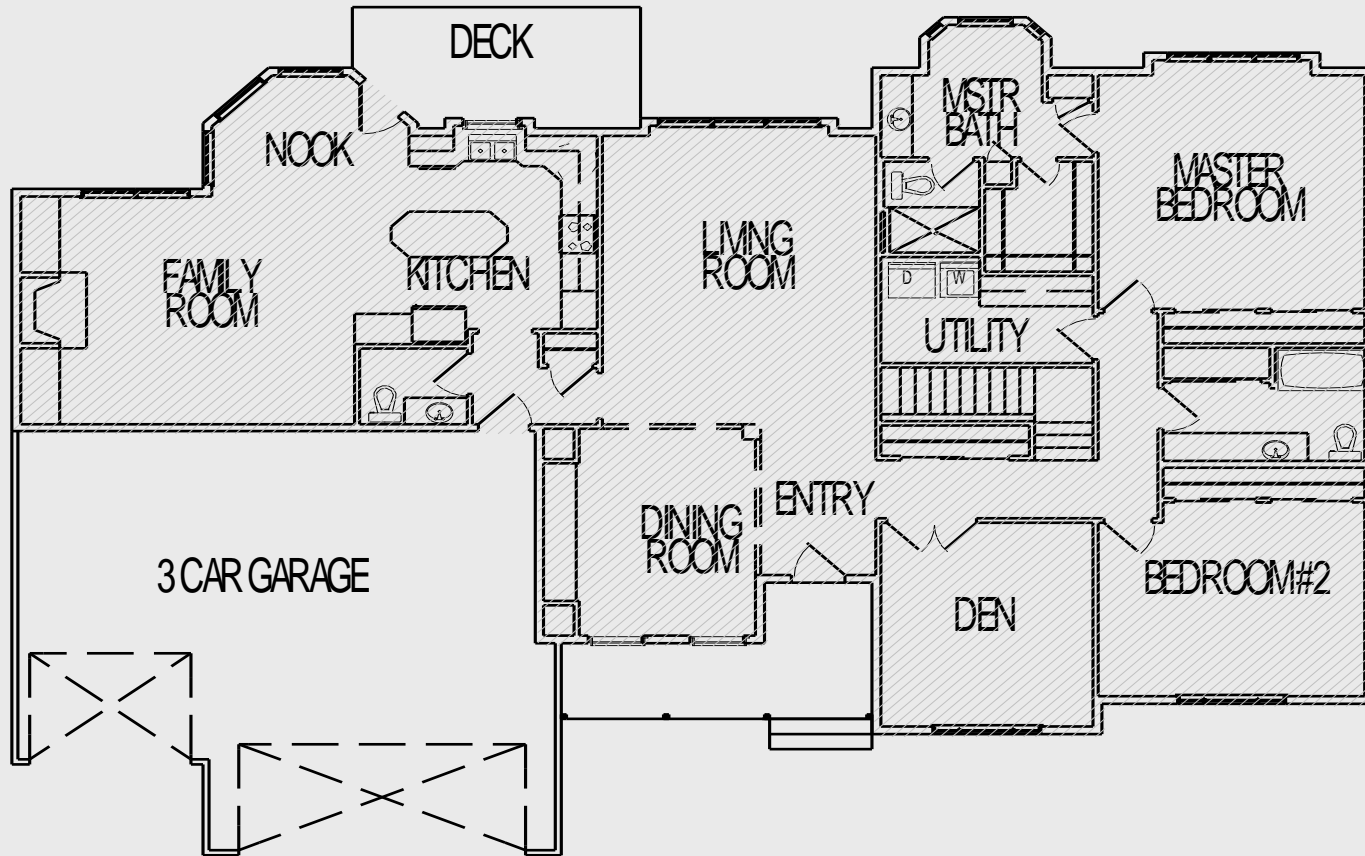
Conditioned Basement



Building Section

► Ceiling Area (adjusted for vaulted ceilings)

Ceiling Area - 2415 sf



► Exterior Wall Areas

12' Exterior Walls – **689 sf**

North – 221 sf

South – 234 sf

East – 52 sf

West – 182 sf

3' knee walls (between 9' & 12' sections) – **153 sf**

West – 69 sf

East – 84 sf

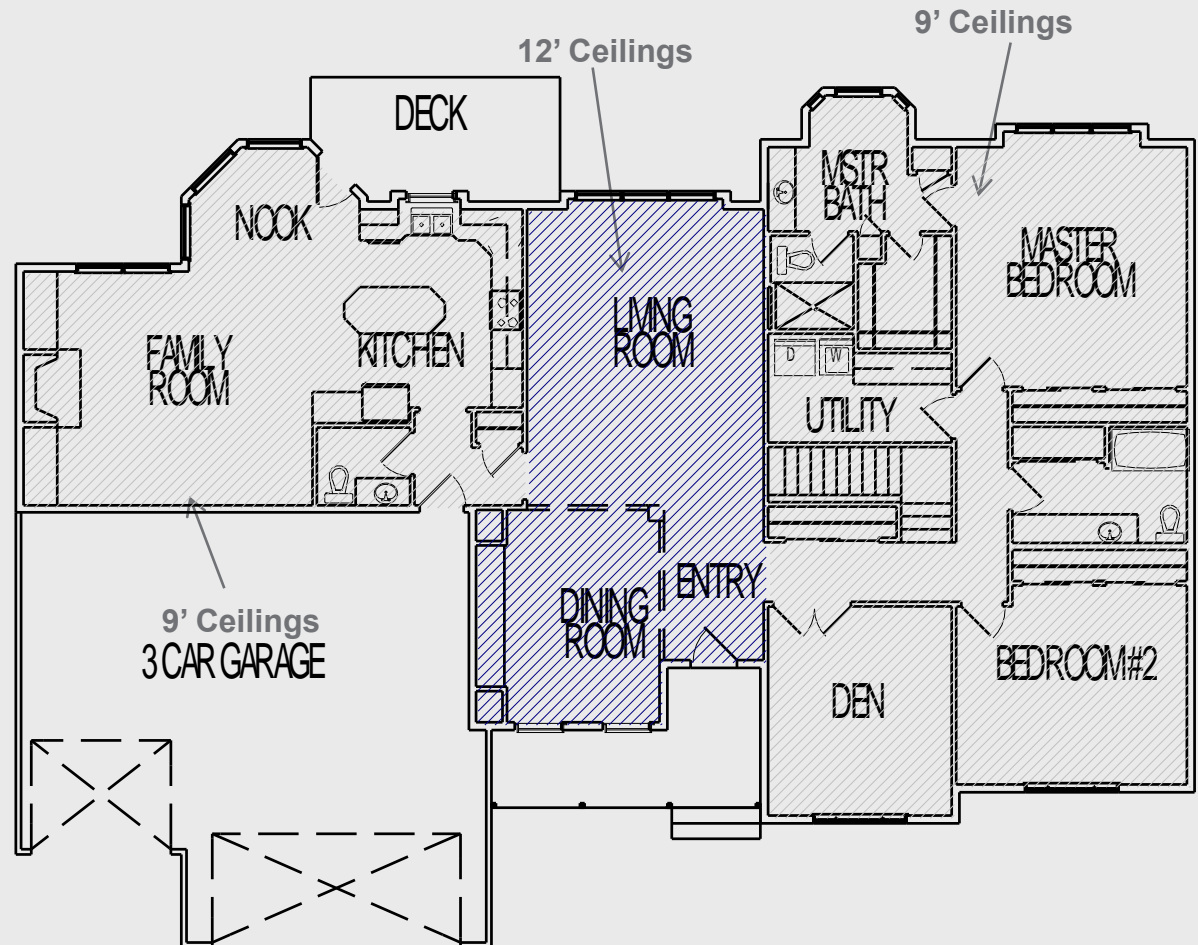
9' Exterior Walls – **2180 sf**

North – 690 sf

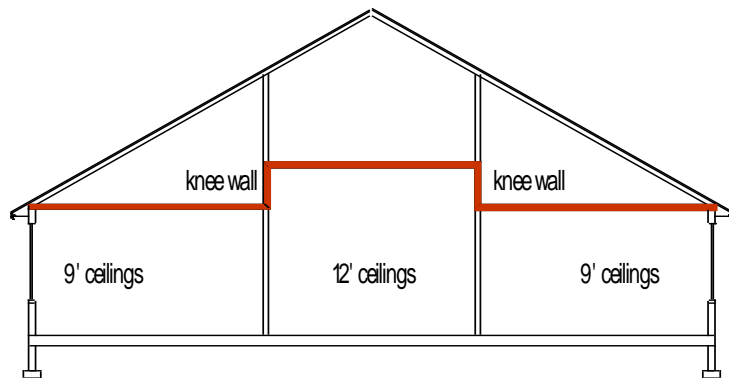
South – 600 sf

East – 440 sf

West – 450 sf

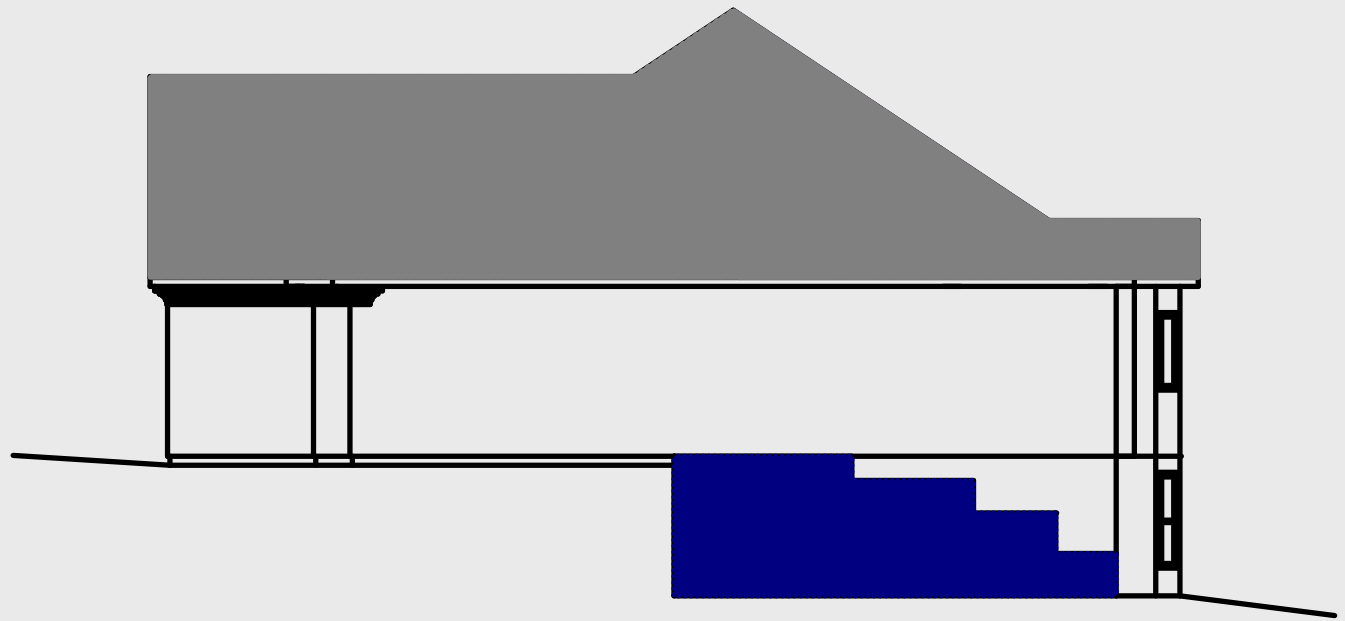


Knee Wall Insulation



No, No... Never cut the batts too short

► Basement Walls – below grade



>50% below grade = below grade concrete basement wall

Ways to Insulate Basement Walls

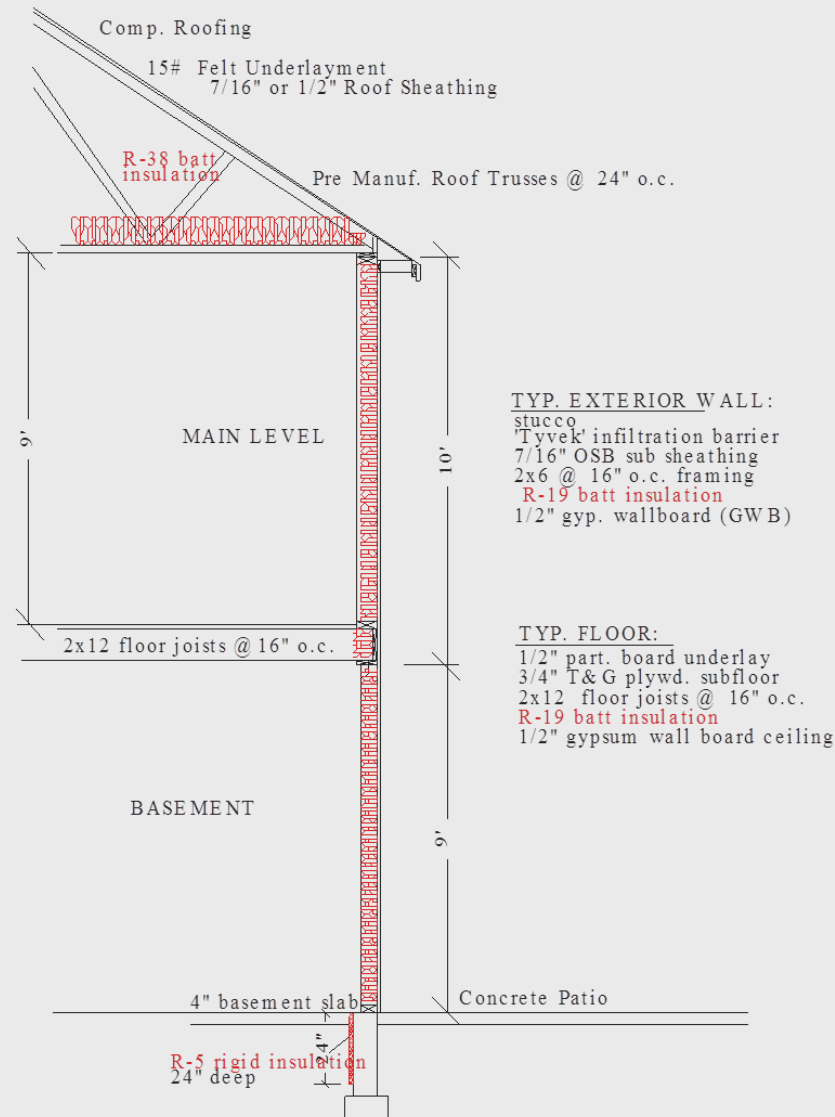


Interior Studs w/batts



Exterior Rigid Foam

► Including Rim Joists in the Exterior Wall Area



BASEMENT SECTION @ EXTERIOR WOOD WALL

► Basement Wall Areas

Above Grade Bsmt Walls (exterior wood) = 837 sf (93' x 9')
(entered as wood frame wall. not a basement wall)

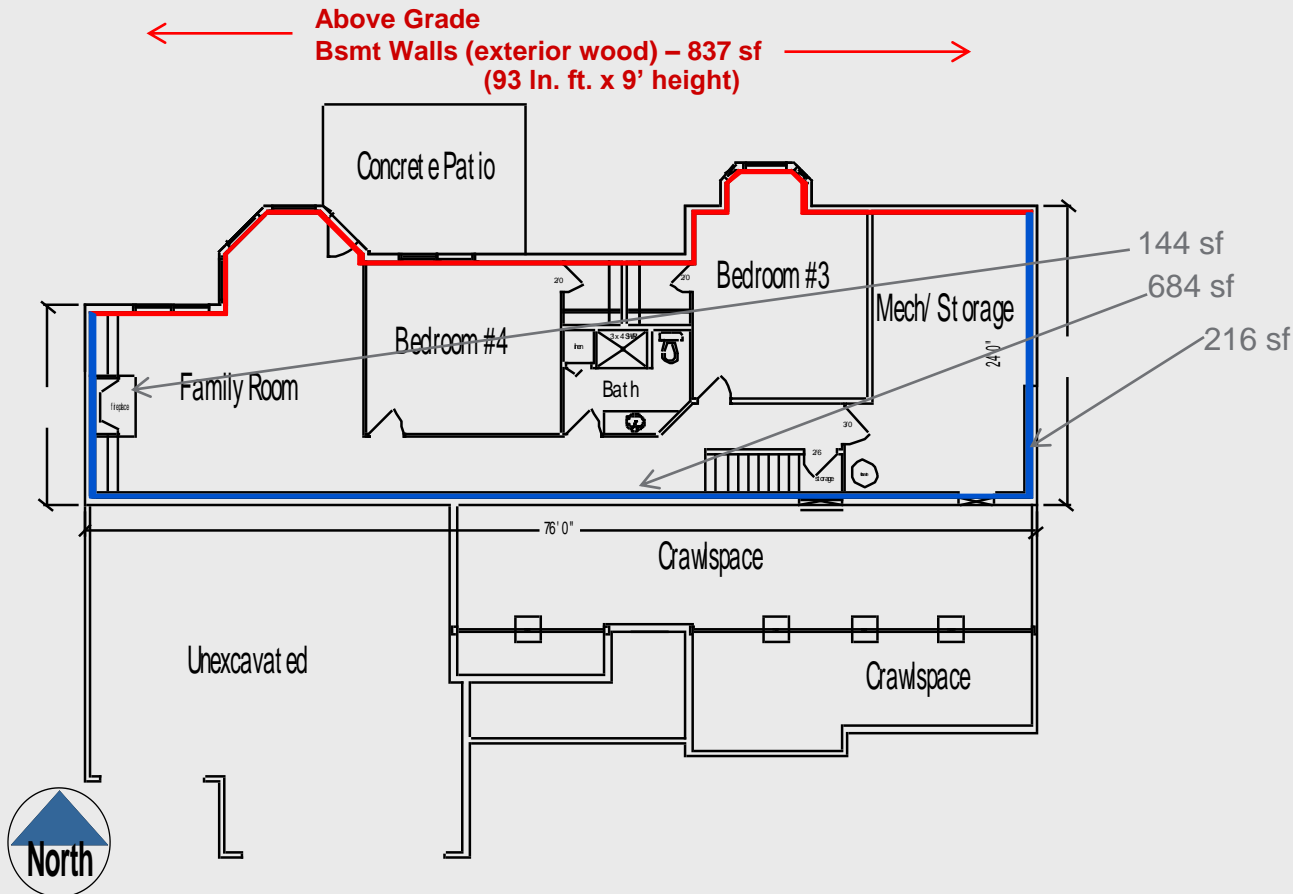
Below Grade Bsmt Walls = 1044 sf

Side basement walls = 360 sf

West Wall – 144 sf

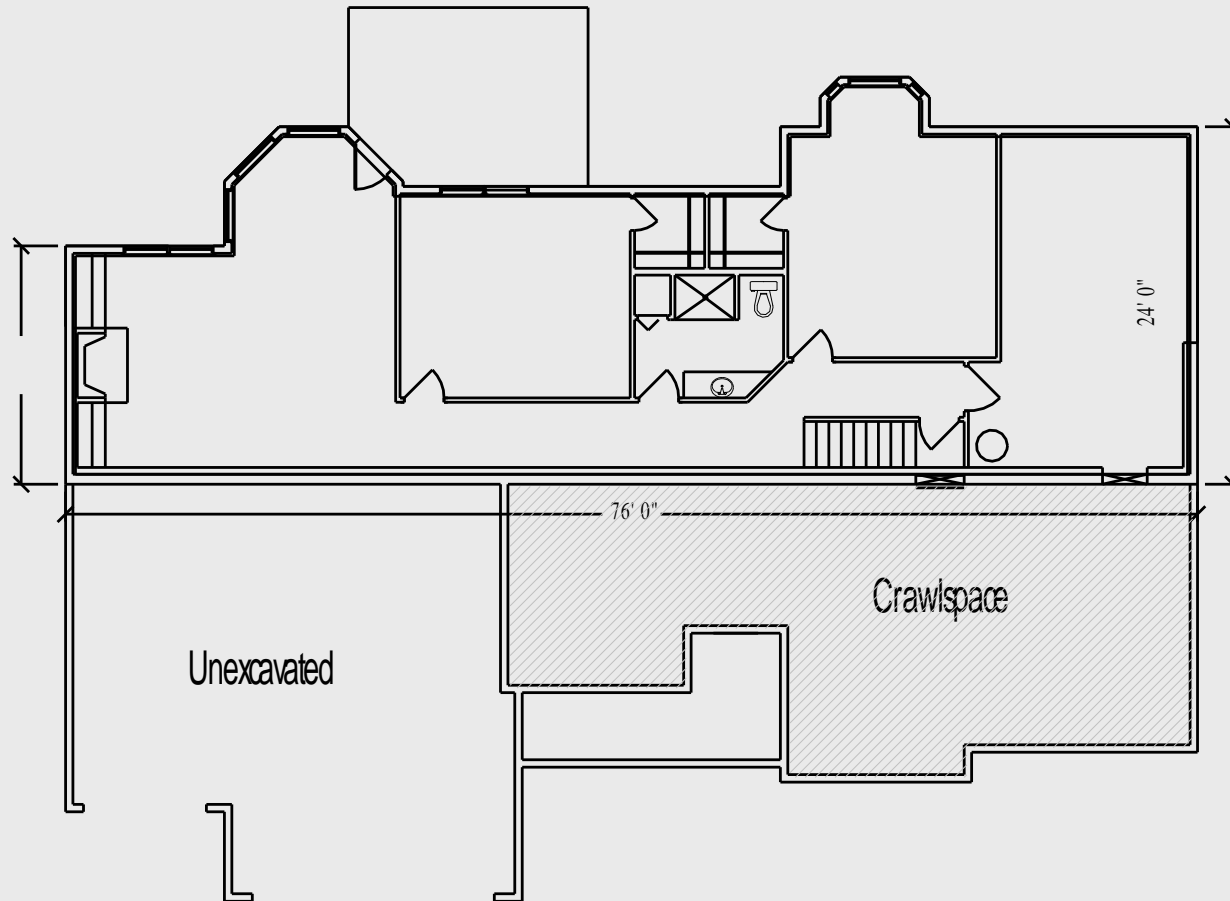
East Wall – 216 sf

Back basement wall = 684 sf (76'x9')



► Floor Area

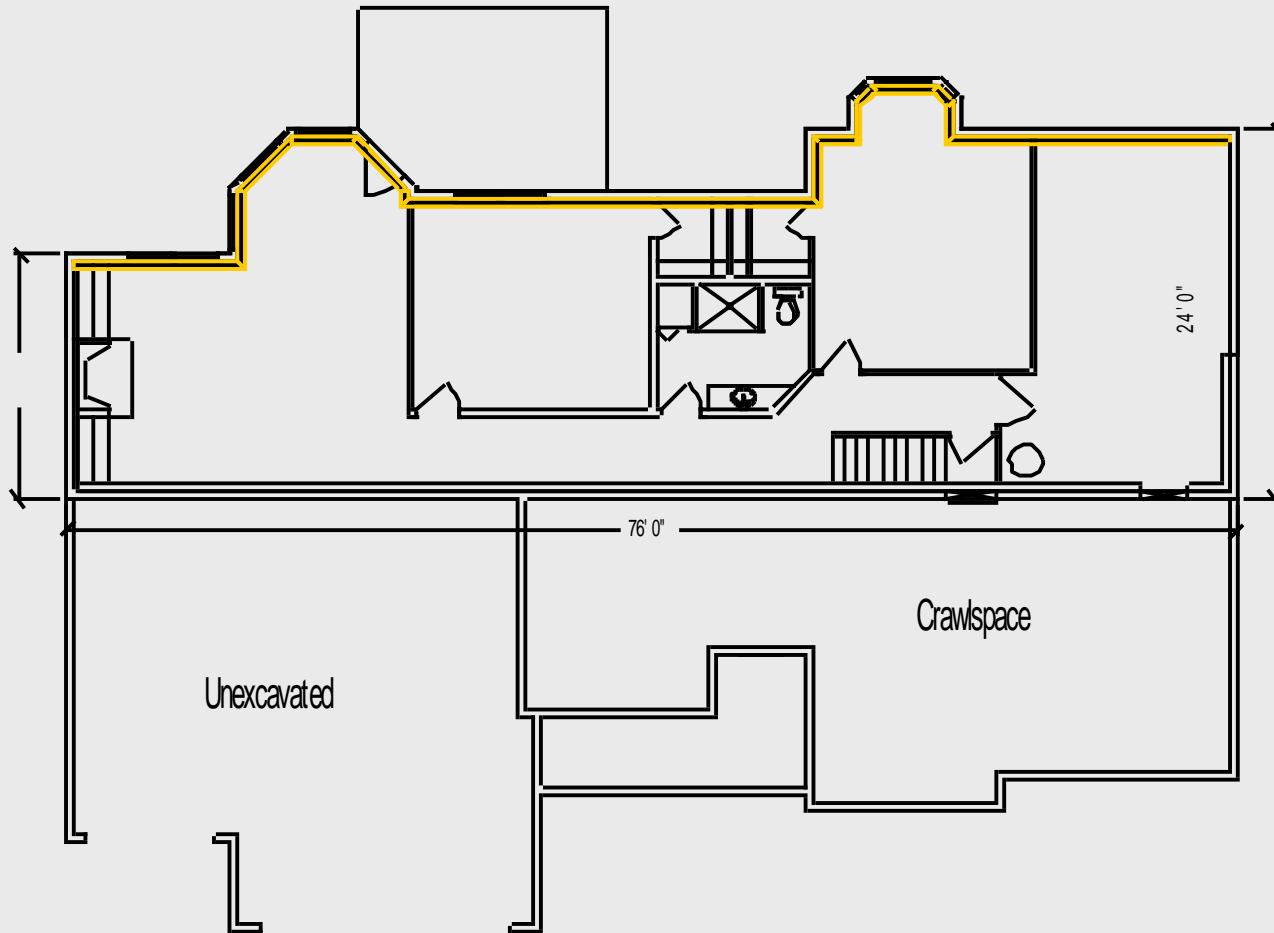
Crawlspace Area – 783 sf



► Slab Perimeter

← Slab Perimeter – 93 linear feet →

Line represents the slab edge to be calculated in linear feet



Slabs in REScheck

Project		Envelope		Mechanical		Requirements							
Ceiling		Skylight		Wall		Window		Door		Basement		Floor	
	Component	Assembly				Gross Area			Cavity Insulation R-Value				
	Building												
1	Floor 1	Click here to select Asse...				0	ft2						
		<div>All-Wood Joist/Truss ▶</div> <div>Steel Frame, 16" o.c. ▶</div> <div>Steel Frame, 24" o.c. ▶</div> <div>Slab-On-Grade ▶</div> <div>Structural Insulated Panels ▶</div> <div>Other (U-Factor Option) ▶</div>											
								<div>Unheated</div> <div>Heated</div>					

Project

Envelope

Mechanical

Requirements

Ceiling

Skylight

Wall

Window

Door

Basement

Floor

Crawl Wall

Component

Assembly

Orientation

Gross Area

Cavity
Insulation
R-Value

Continuous
Insulation
R-Value

▼ Building

1	Ceiling 1	Cathedral Ceiling ▼		1255	ft2	38.0	0.0
2	Ceiling 2	Flat Ceiling or Scissor Truss Cathedral Ceiling Raised or Energy Truss Steel Truss Steel Joist/Rafter, 16" o.c. ▶ Steel Joist/Rafter, 24" o.c. ▶ Structural Insulated Panels (SIPs) Other (U-Factor Option)		294	ft2	38.0	0.0
3	▼ Wall 1			2833	ft2	19.0	7.0
4	Window 1			532	ft2		
5	Door 1			21	ft2		
6	Door 2			10	ft2		
7	Basement Wa			795	ft2	19.0	0.0
8	Basement Wa			119	ft2	19.0	0.0
9	Basement Wa		Wood Frame ▼ Onspeci...	86	ft2	19.0	0.0

Project		Envelope		Mechanical		Requirements									
Ceiling		Skylight		Wall		Window		Door		Basement		Floor		Crawl Wall	
	Component	Assembly		Orientation		Gross Area				Cavity Insulation R-Value	Continuous Insulation R-Value				
	▼ Building														
1	Ceiling 1	Cathedral Ceiling ▼				1255		ft2		38.0	0.0				
2	Ceiling 2	Flat Ceiling or Scissor ... ▼				294		ft2		38.0	0.0				
3	▼ Wall 1	Wood Frame, 16" o.c. ▼		Unspecifi... ▼		2833		ft2		19.0	7.0				
4	Window 1	<div> Wood Frame, 16" o.c. Wood Frame, 24" o.c. Steel Frame, 16" o.c. Steel Frame, 24" o.c. Solid Concrete or Masonry ► Masonry Block with Empty Cells ► Masonry Block with Integral Insulation ► Log Structural Insulated Panels Insulated Concrete Forms Other (U-Factor Option) </div>					532		ft2						
5	Door 1						21		ft2						
6	Door 2						10		ft2						
7	Basement Wa						795		ft2	19.0	0.0				
8	Basement Wa						119		ft2	19.0	0.0				
9	Basement Wa						86		ft2	19.0	0.0				

log.wall.test.v1.rnk - REScheck 3.7 Release 1b

Code: 2003 IECC

File Edit View Options Code Tools Help

Project Envelope

Ceiling Skylight

	Component
	Building
1	Ceiling 1
2	Skylight 1
3	Ceiling 2
4	Wall 1
5	Window 1
6	Window 2
7	Door 1
8	Door 2
9	Wall 2
10	Window 3
11	Wall 3
12	Window 4
13	Floor 1

Log Wall Details

Wood Species:

Log Thickness (nominal width):

The log thickness is the area of the log profile divided by its stack height, rounded to the nearest inch. The inscribed rectangle may be used to establish dimensions of non-rectangular log profiles.

Help

OK

Cancel

Compliance

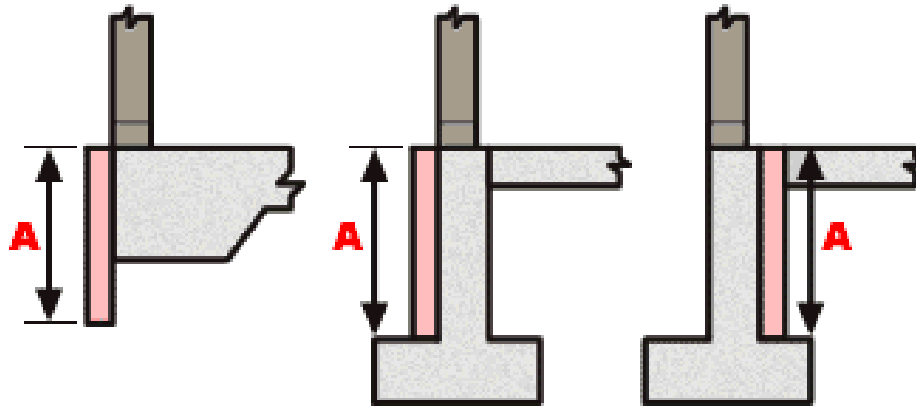
Max. UA

Your UA

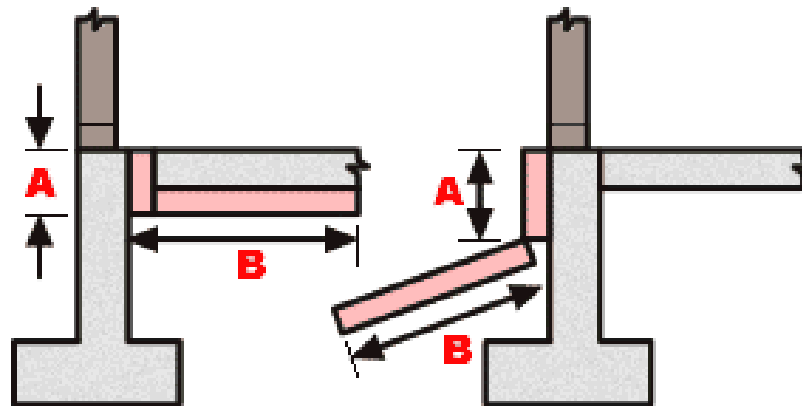
% Better Than Code

Click the Assembly fields to display a list of assembly choices. "Other" assembly types are editable.

Slab Input Dimensions

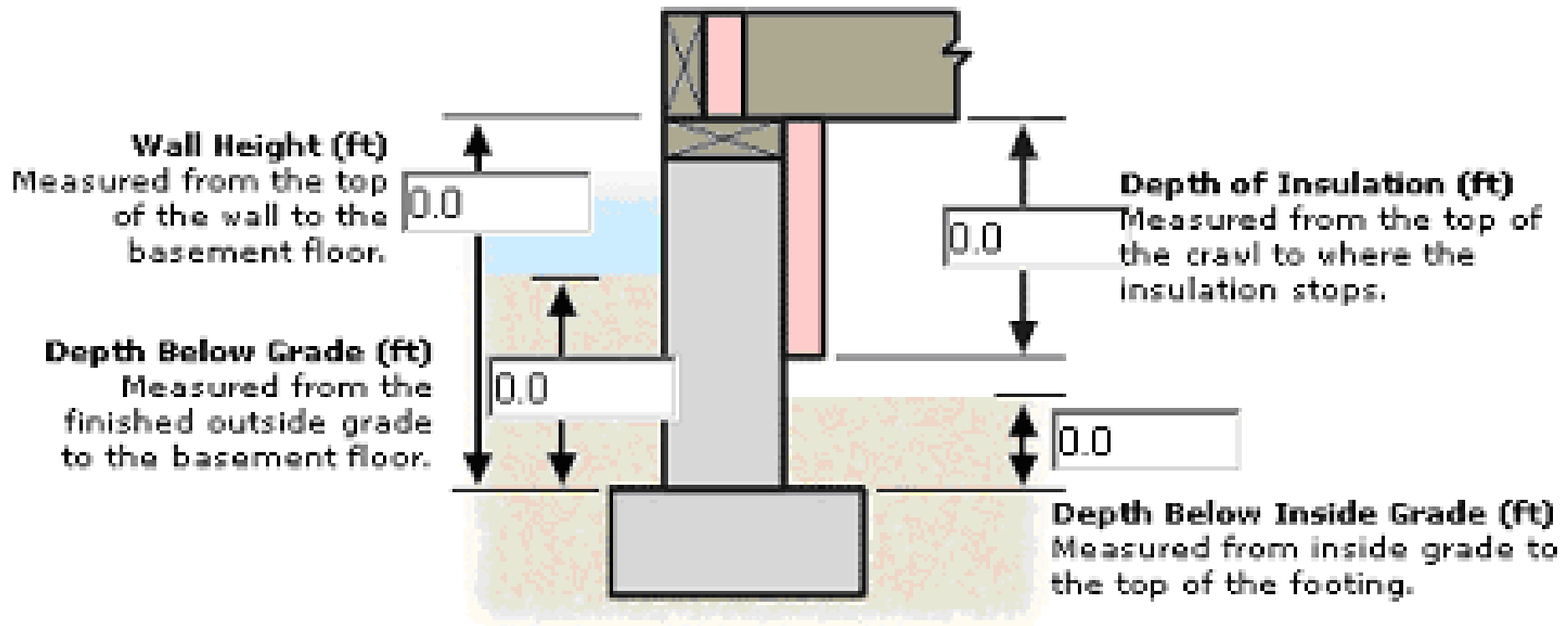


Vertical Insulation (A = Insulation Depth)



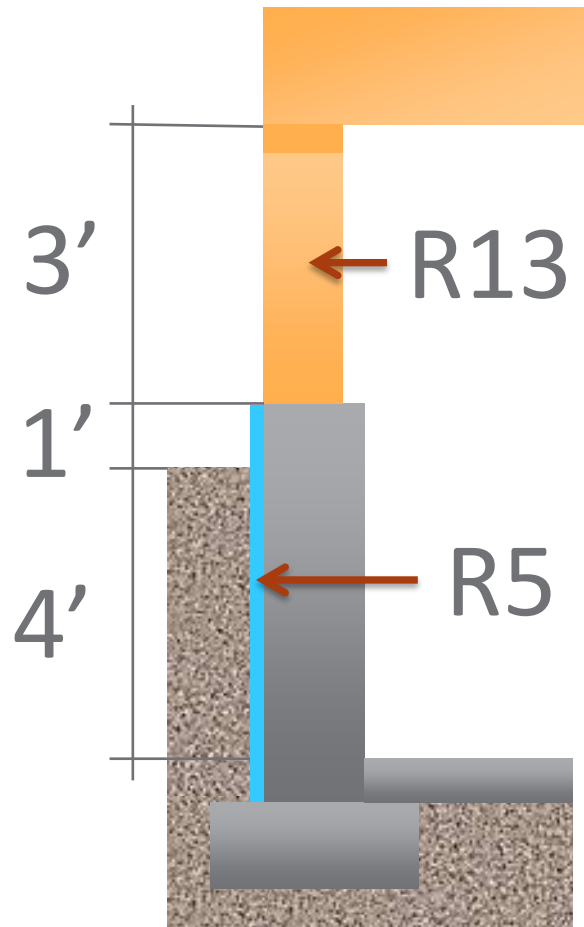
Horizontal Insulation ($A + B$ = Insulation Depth)

Crawlspace Walls



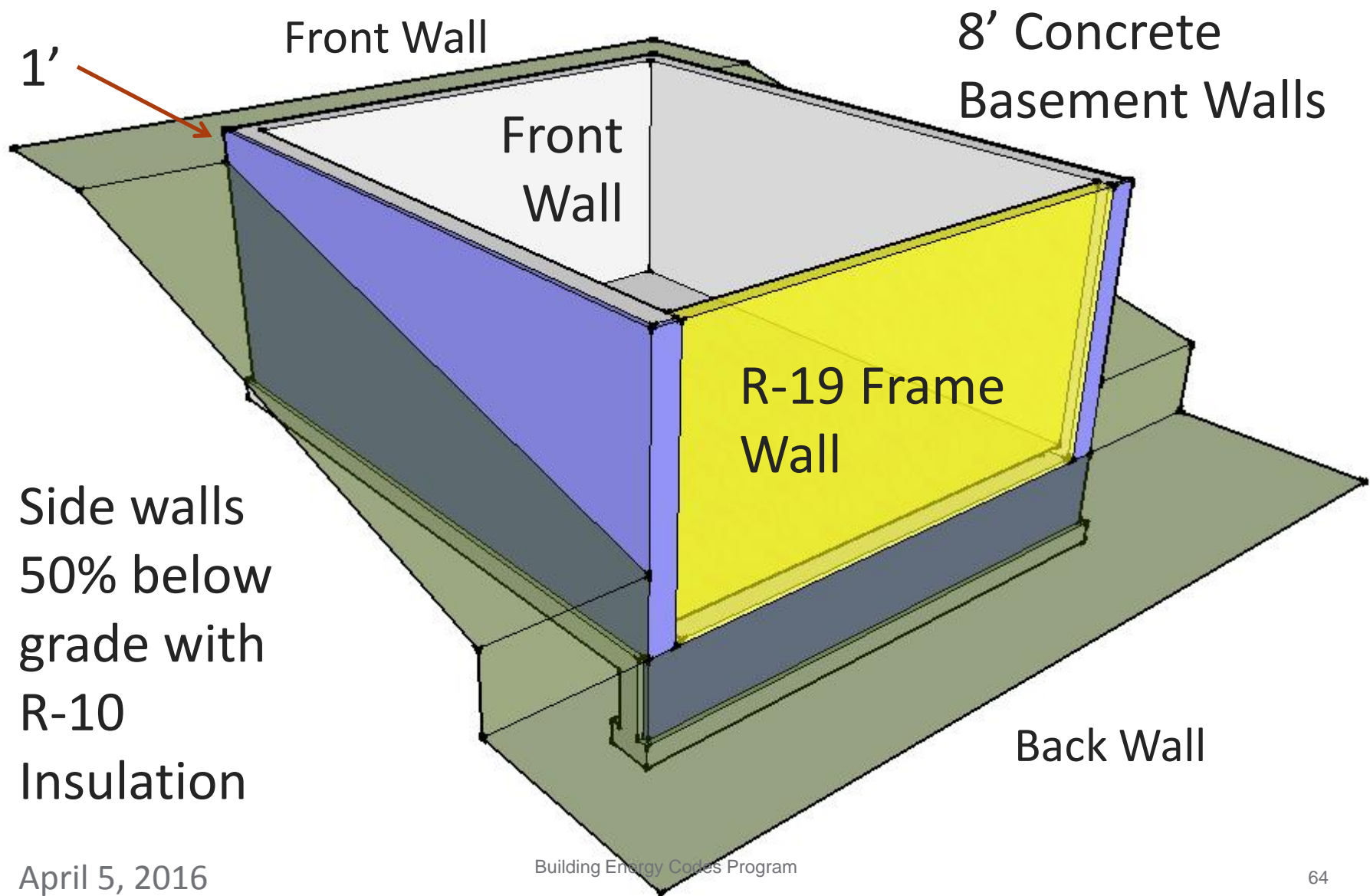
Basement Wall Example 1 – Wood Knee Wall

Create Two Basement Components:



	<u>Wall Height</u>	<u>Depth Below Grade</u>	<u>Depth of Insul</u>
Kneewall	3'	0'	3'
Concrete	5'	4'	5'

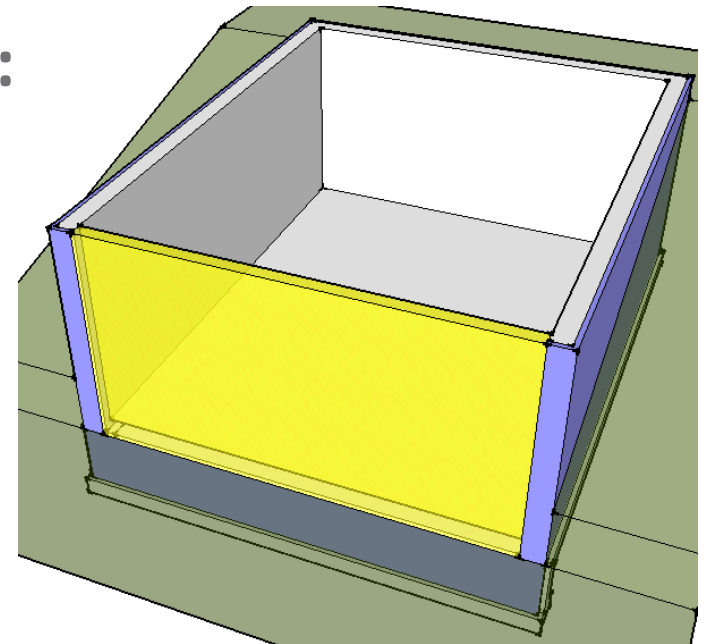
Walk-out Basement Wall – Example 2



Walk-out Basement Wall - Example 2

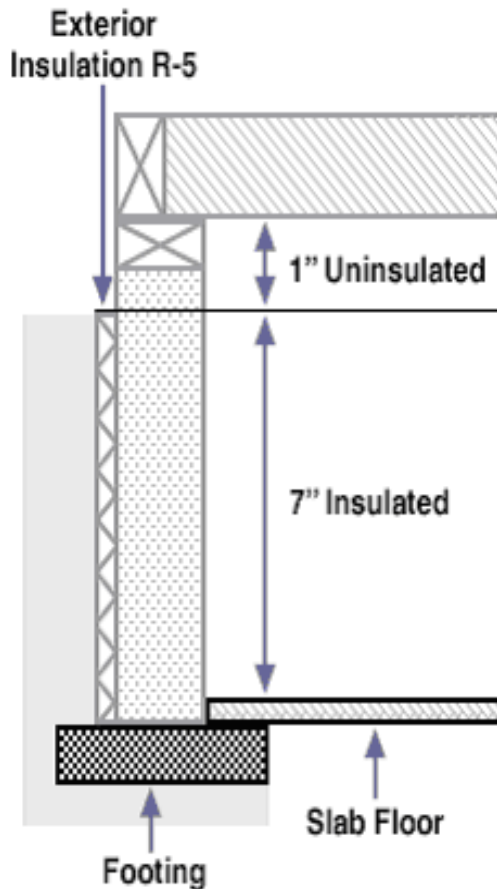
Create Two Basement Components:

	<u>Wall Height</u>	<u>Depth Below Grade</u>	<u>Depth of Insul</u>
Front Wall	8'	7'	8'
Side Walls	8'	4'	8'



- Create one above grade wall for back (walk-out) wall.
- Create one slab-on-grade component with length of back wall as linear feet.

Basement Wall Example 3



Create Two Basement Components:

	<u>Wall Height</u>	<u>Depth Below Grade</u>	<u>Depth of Insul</u>
Uninsulated	1'	0'	0'
Insulated	7'	7'	7'

Areas and R-Values must also be entered.

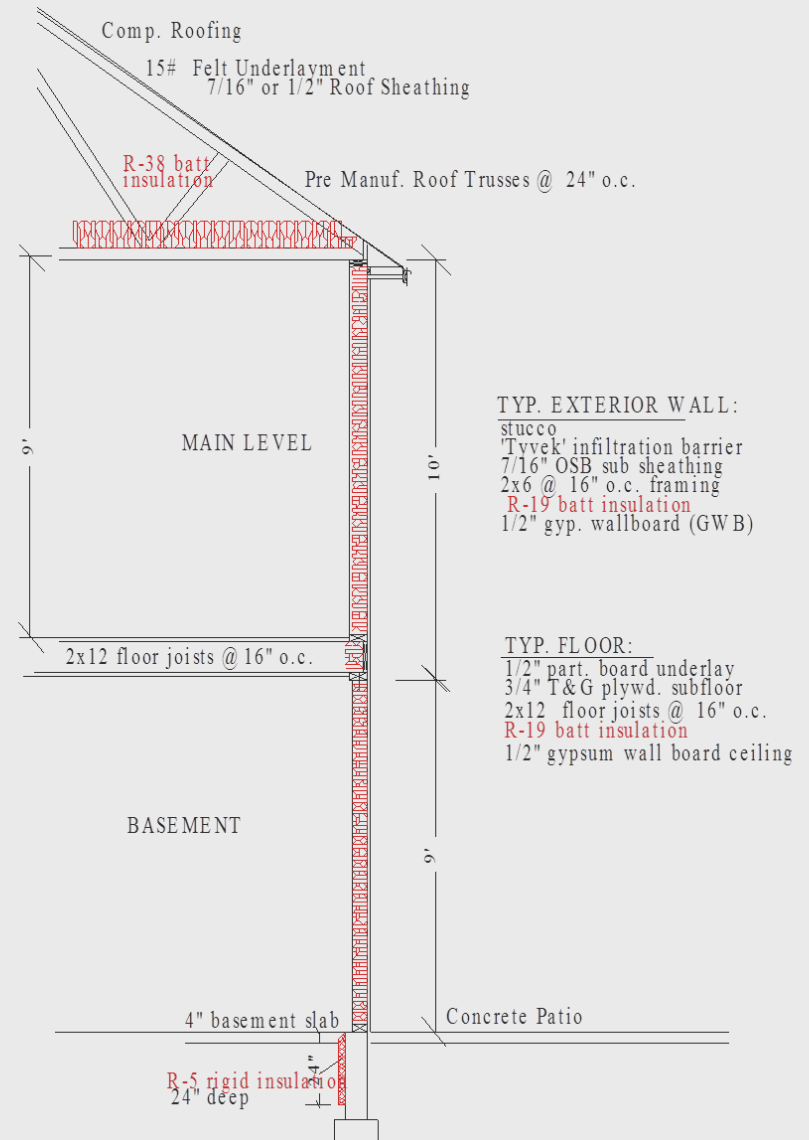
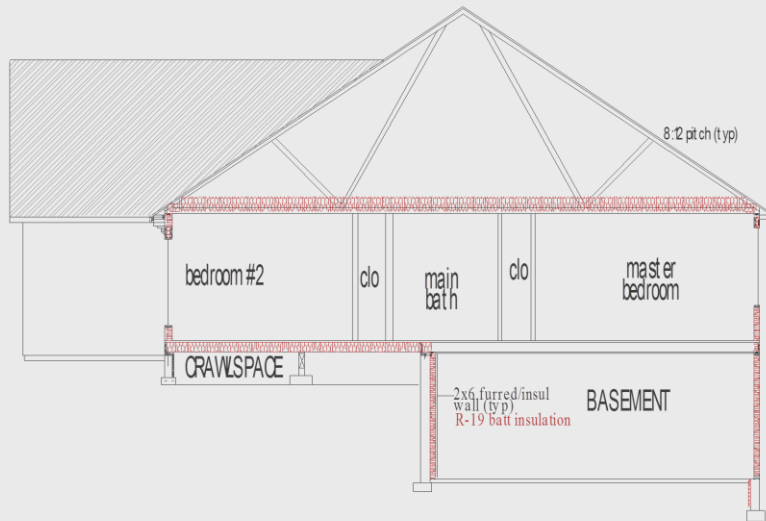
► Insulation Levels

Roof/Ceiling

Walls (above and below grade)

Floor over vented crawl space

Slab-on-grade



► Window/ Door Area

Glass Doors <50% glass - 40 sf; U-factor = 0.50

North – 40 sf

Window Area - 533 sf

North – 369 sf

South – 149 sf

West – 15 sf

U-factor = 0.35

U-factor = 0.27

SHGC = .25

Opaque Doors - 40 sf; U-factor = 0.50

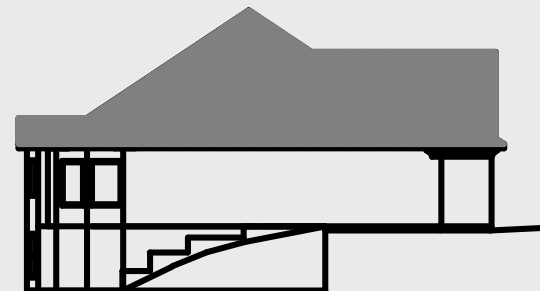
South – 40 sf



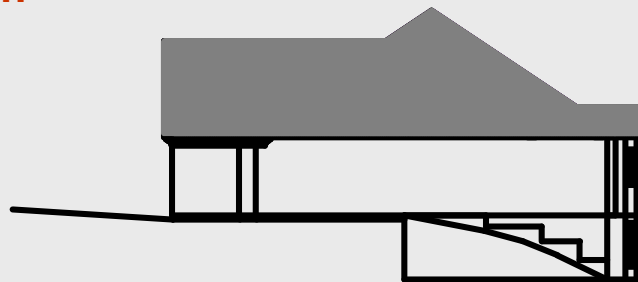
South



North




West



East







REScheck™

DOE's Building Energy Codes Program

Internet Address: www.energycodes.gov
Technical Support: techsupport@becp.pnl.gov



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